

## CLAIMS

1. A gantry for use in the construction process of bridges, viaducts and other structures, said

5 gantry comprising:

a main structure;

at least one unbonded cable;

a first anchorage for securing one end of said unbonded cable to the said structure and a second anchorage for securing the opposite end of said unbonded cable to the said structure;

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**characterized in that**

there is provided at least one sensor unit capable of measuring a physical variation in the said main structure, an electronic interface converting said measurements into readable data and transmitting said data to a controller; said controller being capable of activating an actuator which rests between said structure and said unbonded cable and which is capable of increasing or decreasing the tension of said unbonded cable in accordance to the measurements taken.

15 2. A gantry according to claim 1, **characterised in that** the said controller is at least a

20 computer or automaton capable of running at least a computer program or processing code.

25 3. A gantry according to claim 1 and 2, **characterised in that** the said computer program or processing code is capable of reading the said data transmitted by the said sensor and calculating the intensity and/or direction of the force to be applied by the said actuator on the said unbonded cable.

30 4. A gantry according to claim 1, **characterised in that** the said controller is a human operator controlling manually a switch board connected to the said at least one actuator.

35 5. A gantry according to claim 1, **characterised in that** the said unbonded cable can be internal or external to the contours of said main structure.

6. The gantry according to claim 1 and 5, **characterised in that** said unbonded cable has a linear or multi-linear layout.

7. A gantry according to claim 1, **characterised in that** at least one of said anchorages is moveable away and towards in relation to the said main structure.

5 8. A gantry according to claim 1 and 7, **characterised in that** one actuator is able to move one or more movable anchorages.

9. A gantry according to claim 1, 3 and 4, **characterised in that** said actuator is at least one hydraulic jack placed in between an anchorage and said main structure.

10 10. A gantry according to claim 1, 3 and 4, **characterised in that** said actuator is at least one extendable strut with a first end removably connected to a saddle that supports the said unbonded cable and a second end removably connected to said main structure.

15 11. A gantry according to claim 1 and 10, **characterised in that** the strut or struts which support said saddles are retractable or movable, by translation or rotation.

20 12. A gantry according to claim 1 and 4, **characterized in that** said or each sensor is located in the neighbourhood, on the surface or interior of the elements of the gantry, or is external to the said main structure.

25 13. A gantry according to claim 1, 4 and 12, **characterized in that** said sensor is an extensometer, pressure transducer a LVDT, a laser sensor, a charge cell, an inclinometer, a piezometric sensor or similar device.

14. A gantry according to claim 1 and 3, **characterized in that** said data measured by the said or each sensor useful for the calculation of the said intensity and/or direction of the forces to be applied by the actuator are at least pressures, deflections, rotations, deformations, stresses or load levels.

30 15. A gantry according to claim 1, **characterized in that** the transmission of said readable data between said sensor and said controller and the transmission of said processed data between said controller and said or each actuator is done by electronic circuit, optic-fiber communication, radio frequency, infrared, WI-FI or BlueTooth™ technology.

16. A gantry according to claim 1, **characterised in that** it is capable of providing support for formwork (*in situ* casting structures) or for precast segments, precast girders, or even for other material structural elements.

5 17. A method for providing a pre-existing gantry with a self-adjusting prestressing system, **characterized in that** the said pre-existing gantry is equipped with the elements of claim 1.

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